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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/572,961	01/22/2007	Toshiyuki Fukuda	287529USOX PCT	7355
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OBLON, SPIVAK, MCCLELLAND MAIER & NEUSTADT, P.C. 1940 DUKE STREET ALEXANDRIA, VA 22314				
EXAMINER				
CHU, CHRIS C				
ART UNIT		PAPER NUMBER		
2815				
NOTIFICATION DATE		DELIVERY MODE		
07/09/2008		ELECTRONIC		

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

patentdocket@oblon.com  
oblonpat@oblon.com  
jgardner@oblon.com

# Office Action Summary

**Application No.**

10/572,961

**Applicant(s)**

FUKUDA ET AL.

**Examiner**

CHRIS C. CHU

**Art Unit**

2815

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 07 May 2008.  
2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.  
3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1 - 6 is/are pending in the application.  
4a) Of the above claim(s) 5 is/are withdrawn from consideration.  
5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.  
6) ☒ Claim(s) 1 - 3 and 6 is/are rejected.  
7) ☒ Claim(s) 4 is/are objected to.  
8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.  
10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).  
11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).  
a) ☒ All b) ☐ Some \* c) ☐ None of:  
1. ☒ Certified copies of the priority documents have been received.  
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.  
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- 1) ☒ Notice of References Cited (PTO-892)  
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-946)  
3) ☒ Information Disclosure Statement(s) (PTO/SE-08)  
Paper No(s)/Mail Date 3/27/08 & 3/21/08  
4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date \_\_\_\_\_  
5) ☐ Notice of Informal Patent Application  
6) ☐ Other: \_\_\_\_\_

## DETAILED ACTION

### *Election/Restrictions*

1. Applicant's election without traverse of Group I (claims 1 – 4 and 6) in the reply filed on May 7, 2008 is acknowledged.

### *Claim Rejections - 35 USC § 102*

2. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

3. Claims 1 – 3 and 6 are rejected under 35 U.S.C. 102(b) as being anticipated by Yoshida et al. (U. S. Pat. No. 5,213,877).

Regarding claim 1, Yoshida et al. discloses in e.g., Fig. 2 a ceramic circuit board (31; column 2, line 32) prepared by integrally joining a circuit layer (32 and 34a; column 2, lines 33 and 34) composed of a clad member (see e.g., Fig. 2) including

- an Al plate (32; column 2, line 33 and column 4, lines 37 – 39) and
- an Al-Si brazing material (34a; column 2, line 34 and column 4, lines 40 – 44) to a ceramic substrate (31; column 2, line 32),
- wherein a surface of the clad member adjacent to the Al-Si brazing material (34a) is joined to the ceramic substrate (31) with an Al alloy film (31a; column 2, lines 32 and 33) therebetween (see e.g., Fig. 2), the Al alloy film (31a) having a thickness of less

than 1  $\mu\text{m}$  (column 2, lines 55 and 56) and being provided on the surface of the ceramic substrate (31; see e.g., Fig. 2).

Regarding claim 2, Yoshida et al. discloses in e.g., Fig. 2 the ceramic substrate (31) comprising an aluminum nitride sintered body (column 2, lines 36 and 37), a silicon nitride sintered body, a silicon carbide sintered body, or a sialon sintered body.

Regarding claim 3, Yoshida et al. discloses in e.g., Fig. 2 the Al content of the Al-Si brazing material (34a) being 85 mass percent or more and the Si content of the Al-Si brazing material is in the range of 6 to 15 mass percent (column 4, lines 40 – 44).

Regarding claim 6, Yoshida et al. discloses in e.g., Fig. 2 a power module (the power module in Fig. 2) comprising:

- a ceramic circuit board (31) prepared by integrally joining a circuit layer (32 and 34a) composed of a clad member including
  - \* an Al plate (32) and
  - \* an Al-Si brazing material (34a) to a ceramic substrate (31),
  - \* wherein a surface of said clad member adjacent to said Al-Si brazing material (34a) is joined to said ceramic substrate (31) with an Al alloy film (31a) therebetween (see e.g., Fig. 2), said Al alloy film (31a) having a thickness of less than 1  $\mu\text{m}$  (column 2, lines 55 and 56) and being provided on the surface of said ceramic substrate (31; see e.g., Fig. 2);
- a semiconductor element (35a; column 3, line 27) mounted on said circuit layer (32 and 34a; see e.g., Fig. 2); and

- a heat sink (33; column 2, line 33) that dissipates heat generated from said semiconductor element (35a) via said ceramic circuit board (31; see e.g., Fig. 2).

***Allowable Subject Matter***

4. Claim 4 is objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

(A) Claim 4 contains allowable subject matter because none of references of record teach or suggest, either singularly or in combination, at least the limitation of an Al alloy film comprising at least one rare earth element selected from Y, Sc, La, Ce, Nd, Sm, Gd, Tb, Dy, Er, Th, and Sr in an amount of 1 to 5 atomic percent.

***Conclusion***

5. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Nagatomo et al., Naba et al., Yoshida et al., Nagase et al. '787, Nagase et al. '185, Tsukaguchi et al., Sasaki et al., Baba et al. and Nagase et al. disclose a ceramic substrate with multi-layers.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to CHRIS C. CHU whose telephone number is (571)272-1724. The examiner can normally be reached on 11:30 - 8:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Kenneth Parker can be reached on 571-272-2298. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Chris C. Chu  
Primary Examiner  
Art Unit 2815

/Chris C. Chu/  
Primary Examiner, Art Unit 2815  
Friday, July 04, 2008